IFW AF/1722

PATENT APPLICATION

PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Takehiro KATA et al.

On Appeal from Group: 1722

Application No.: 09/431,154

Examiner: J. Mackey

Filed: November 1, 1999

Docket No.: 104639

For: VULCANIZING MOLD FOR PNEUMATIC TIRES

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto are three (3) copies of our Brief on Appeal in the above-identified application.

Also attached hereto is our Check No. 154984 in the amount of Three Hundred Thirty Dollars ($330.00) in payment of the Brief fee under 37 C.F.R. 1.17(c). In the event of any underpayment or overpayment, please debit or credit our Deposit Account No. 15-0461 as needed in order to effect proper filing of this Brief.

For the convenience of the Finance Division, two additional copies of this transmittal letter are attached.

Respectfully submitted,

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Date: June 14, 2004

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re the Application of:

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BRIEF ON APPEAL

Appeal from Group 1722

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I. Introduction

This is an Appeal from an Office Action mailed January 23, 2004, finally rejecting claims 1, 2 and 4-6 of the above-identified application.

A. Real Party in Interest

The real party in interest in this Appeal is Bridgestone Corporation, by way of an Assignment recorded at Reel/Frame 010535/0933 on February 7, 2000.

B. Statement of Related Appeals and Interferences

There are presently no appeals or interferences, known to appellants, appellants representative or the assignee, which will directly effect or be directly effected by or have a bearing on the Board's decision in the pending appeal.

C. Status of Claims

Claims 1, 2 and 4-6 are pending. Claims 1, 2 and 4-6 are rejected and are being appealed. Claims 1 and 6 are independent claims. Claims 1, 2 and 4-6 are set forth on the attached Appendix of Claims.

D. Status of Amendments

On June 4, 2003, a Request for Continued Examination was filed requesting entry of the Amendment After Final Rejection filed on May 19, 2003 that was not entered. Subsequent to the entry of the Amendment on June 4, 2003, the claims were rejected on June 24, 2003 and a Request for Reconsideration was filed on December 17, 2003 requesting the rejection be withdrawn. The request was denied and the claims were again finally rejected on January 23, 2003. In response to the final rejection, an additional Request for Reconsideration was filed on April 7, 2004, requesting the rejection of the claims be withdrawn. The request was again denied in an Advisory Action mailed on April 16, 2004.

II. Summary of the Invention and Applied References

A. The Claimed Invention

The subject matter of this application relates to a vulcanizing mold and vulcanizing method for pneumatic tires. The mold and method of this application pertain to reducing the size of a vulcanizing machine.

According to an exemplary embodiment of the subject matter of this application, the upper and lower tread mold members 6, 7 are constituted of the upper segments and lower segments 8, 9, respectively, which can be radially displaced to decrease or increase the diameter of the mold. When the mold is opened to remove the product tire from the mold, all of the segments are displaced radially outward to increase the diameter by virtue of the operation of the cam ring 13. Thus, it is possible to smoothly disengage the projections and/or ridges on the inner surfaces of the segments from the recesses or grooves in the tread of the tire. The mold is then opened by vertically displacing the upper and lower tread mold members 6, 7 away from each other, thereby allowing removal of the tire from the mold. On such occasion, because the recesses or grooves in the tread of the tire have already been disengaged from the projections and/or ridges on the inner surfaces of the segments, the tire can be positively removed from the mold without forming defects in the tread land region such as nicks and/or cracks (Page 7, line 14 - page 9, line 27; page 12, lines 1-7; Figs. 2 and 3).

Furthermore, when the mold is opened from the position in which the upper and lower tread mold members are in abutment with each other, it is unnecessary to displace the upper and lower tread mold members as an integral assembly toward the upper side over a large distance (Page 3, line 19 - page 4, line 8). Thus, as compared to the prior art, the subject matter of this application serves to minimize the required displacement amount of the respective segments radially outward, within such a degree that the maximum projections or

ridges on the inner surface of the segments can be fully disengaged from the recesses in the tread. It is therefore possible to effectively avoid an undesirable increase in the outer diameter of the mold as a whole (Page 4, lines 8-14).

Preferably, in an exemplary embodiment of the vulcanizing mold, the upper and lower segments are engaged with the upper and lower base plates 1, 2, respectively, such that they are radially displaceable relative to respective one of the sidewall mold members, either directly or indirectly through slide guide members which may be provided on the sidewall mold members. In this way, it is possible to always achieve a smooth radial displacement of the segments relative to the respective sidewall mold members, and to positively prevent undesired withdrawal of the segments vertically upwards or downwards (Page 4, lines 15-22).

Preferably, the cam ring 13 is engageable with both of the upper and lower segments of the upper and lower base plates sides. In this way, it is possible to positively achieve the required radial displacement of the respective segments by the operation of the cam ring, to ensure that such displacement is guaranteed without specific actuators or biasing springs for exerting biasing force radially outward, and to prevent unintended expansion or contraction of the mold due to the engagement of the segments with the cam ring (Page 4, line 23 - page 5, line 7).

However, insofar as the lower segments of the lower tread mold member are concerned, which are disengaged from the cam ring when opening the mold, it is also possible to urge them radially outwards by means of an actuator or a biasing spring, to thereby hold the segments in their diameter expanding posture (Page 4, line 23 - page 5, line 7).

Preferably, the upper segments are always in engagement with the cam ring on radially inner side thereof. In this instance, the cam ring has an initial posture in which it is in contact with the upper segments along the entire height thereof. Thus, upon closing the mold,

it is possible to minimize the downward stroke of the cam ring required for fully displacing the upper and lower segments radially inwards. As a result, it is possible to advantageously reduce the vertical dimension of the mold, and the mold closing process can be completed within a short period of time (Page 5, lines 8-15).

There are also abutment members 14 for defining the upper limit position of the cam ring 13 relative to the upper base plate 12. In this way, the engagement of the cam ring with the upper segments of the upper base plate side can be assured, and the subsequent mold opening operation can be continued by an upward driving force applied to the cam ring (Page 11, lines 24-28).

According to another aspect of the invention, there is provided a vulcanizing method for pneumatic tires with a vulcanizing mold which comprises: (i) upper and lower base plates 3, 2; (ii) upper and lower sidewalls mold members 4, 5 attached to said upper and lower base plates, respectively; and (iii) upper and lower tread mold members 6, 7 attached to said upper and lower base plates, respectively; (iv) said upper and lower tread mold members being constituted of upper segments and lower segments 8, 9, respectively, which can be radially expanded and contracted relative to the upper and lower sidewall mold members, respectively. In an exemplary method, the upper and lower sidewall mold members are displaced toward each other so that the upper and lower segments are brought into abutment with each other. Then, a single cam ring is operated to simultaneously displace all of the segments radially inwards and relative to the upper and lower sidewall mold members, with the upper segments in abutment with the lower segments in order to perform the required pattern formation on the tread portion of a green tire (Page 5, line 21 - page 6, line 8).

In the exemplary method, the formation at the side portions of a green tire is performed before the formation at the tread portion of the green tire, by means of the sidewall mold members have forming inner surfaces which are substantially free from unevenness. It

is thus possible to significantly reduce the flow of the rubber material due to the formation, effectively preventing the flow of the rubber material into a space, if any, between the sidewall mold members and the segments on their radially outer sides. As a result, it is possible to advantageously prevent the rubber material from biting between the sidewall mold members and the segments which are being displaced radially inwards, for performing subsequent formation at the tread portion of the green tire (Page 6, lines 9-19).

B. Applied References

1. Great Britain Patent No. 1,248,891 to Herbert et al.

In GB Patent No. 1,248,891 to Herbert et al. (hereinafter "Herbert"), a molding press for vulcanizing tires having moveable upper and lower mold parts is disclosed. In operation, starting from an open position, the moveable parts of the press are lowered until a support 41 of the upper mold part 2 has arrived at its final position. During the downward movement of the upper mold part 2, projections 81 formed on the upper segments 42 are engaged with aligned recesses 34 formed on lower segment parts 10, which are normal to the access of the mold. Upon engagement, a release pin 28 formed in the lower segments 10 is pressed downward and an arresting pin 22 is forced out of an arresting bore 29.

During the continued operation of the press, a plate 45 is pressed downward with a force by means of a closing mechanism of the press whereby the opening pressure of a valve 63 is exceeded in the operating space 53. As a result, the pressure medium is squeezed out of the operating space 53 and the plate 45 can be lowered until it makes contact with the support 41. The pressure ring (actuator) 43 is also driven downward, and as a result the pressure ring 43 moves in relation to the upper segments 42. The upper segments are thus pushed radially inward until they assume a position as shown in Fig. 4, in which position the mold is closed and the upper segments are coupled to the lower segments by the engagement of the projections 81 formed on the upper segments 42 and the recesses 34 formed in the lower

segments 10. Because of the coupling of the upper segments 42 with the lower segments 10 by means of projections 81 and recesses 34, the lower segments are driven radially inward, which mode is possible because the arresting pins have been released. (See page 5, line 44-96). Thus, the upper and lower segments are only driven radially inward when the pressure ring 43 is in indirect engagement with the upper segment 42. When the pressure ring 43 contacts both the upper and lower segments, the segments are no longer being driven radially inward (see Fig. 4), i.e., "the upper segments are thus pushed radially inward until they assume the position shown in Fig. 4" (page 5, lines 80-83).

2. U.S. Patent No. 5,208,044 to Miyata et al.

U.S. Patent No. 5,208,044 to Miyata et al. (hereinafter "Miyata") relates to vulcanizing molds, and more particularly to split vulcanizing molds for tires. The mold of Miyata includes upper and lower mold members 1, 2 a treadmold sector 3 and a two piece actuator (tapered ring) 4a, 4b which are movable upward and downward relative to the treadmold sector 3.

The upper actuator portion 4a is annular and is secured to an upper platen 6a with bolts, or other fastening members, 10 and has an inner periphery formed with a circumferential recess 7. The treadmold sector 3 is also divided into two blocks. An upper sector portion 3a that is fittable into the recess 7 of the upper actuator 4a has a tapered outer surface 9 which is slidable in contact with the inner peripheral surface 7a defining the recess 7.

Each block of the lower treadmold sector 3b has a slanted outer surface 18, similar to the outer surface 9 of the upper sector 3a, and a lower surface 20 slidable on a horizontal surface portion 19 of the lower mold member 2 and is mounted on the lower mold member 2. The lower mold member 2 is attached to a lower platen 6b. The lower actuator 4b is annular and has an inner peripheral surface 23 in the form of the same slanting surface as the inner

peripheral surface 7a of the upper actuator 4a. The surface 23 is slidable in contact with the outer surface 18 of the lower treadmold sector 3b.

The upper actuator portion 4a and the lower actuator portion 4b are moveable upward and downward relative to the treadmold sector 3, and the treadmold sector 3 is divided into upper sector portioned 3a radially slidable in contact with the upper actuator portion 4a for opening and closing by the relative upward and downward movement of the upper actuator portion 4a. The lower tread mold sector 3b is radially slidable in contact with the lower actuator portion 4b for opening and closing by the relative upward and downward movement of the lower actuator portion 4b. By constructing the mold as described, the upper and lower mold members can be provided at a position optimum for the tire performance, i.e., around the tire sidewall, as desired without being limited by the sliding distance.

By this arrangement, only one of the treadmold sectors 3a, 3b is pushed by the pushing means, so that a parting line between the upper and lower sector portions will not shift upward or downward, permitting these portions to radially slide along at the same level at all times to close the mold. Further, the upper and lower sector portions are thus slidingly moveable radially at the same time without any lag with respect to each other. Accordingly, by using the two piece actuator 4a, 4b, Miyata is able to address the problem of improper shift of the parting line of the upper and lower sector pieces or sector pieces likely to move radially which results in the center of the equator being positioned off center of the mold impairing uniformity of the tire.

3. U.S. Patent No. 3,806,288 to Materick

U.S. Patent No. 3,806,288 to Materick (hereinafter "Materick") relates to a mold mechanism for curing and molding a tire under heat and pressure and, more particularly, to a mold mechanism of the segmental type which is particularly adapted for molding and curing radial tires.

The mold mechanism of Materick includes upper and lower mold sections 10, 12 for forming side walls and a plurality of one piece tread mold segments 14 disposed therebetween. Each tread molding segment 14 is mounted between the mold sections 10 and 12 for radial movement relative thereto. Outward movement of the segments 14 is affected by resilient biasing means, i.e., coil springs.

The movable mold section 10 is carried upon a carrier plate 60 and spaced therefrom under the action of a plurality of coil compression springs 62. The coil compression springs are located to act between the carrier plate 60 and the upper mold section 10. These springs have their outer ends contained by circular recesses formed in the opposed faces of the plate 60 and the mold 10, respectively, and are compressible to permit the carrier plate 60 to move into full contact with the mold section 10 when sufficient axial force is applied to the carrier plate to overcome the biasing force of the compression springs 62.

A skirt 65 is formed with a radially outwardly tapering frusto-conical surface 68 adapted for engagement of the inwardly tapering frusto-conical surfaces 70 of the tread mold segments 14. Thus, axial closing movement of the carrier plate 60 and the attached upper mold section 10 toward the lower mold section 12 will cause the radially inner surface 68 of the skirt 65 to be brought into contact with the radially outer surfaces 70 of the segments 14 which, in their initial positions, are located at their radially outer most positions under the biasing influence of the coil springs 42.

By carefully correlating the pre-loading pressure of the springs 62 on the plate 60 with the biasing force of disk springs 46, 47 on the segments 14, full contact between surfaces 20 and 54 can be prevented until the segments actually contact the tread region of the green tire. Upon completion of the curing operation the press is opened allowing the resilient disk springs 46, 47 to again separate the surfaces 20 and 56 and also allowing the springs 42 to push the segments 14 radially outwardly to their radially outermost position.

4. U.S. Patent 3,990,823 to Le Moullac

U.S. Patent No. 3,990,823 to Le Moullac (hereinafter "Moullac") relates to sectional molds used for the molding and the vulcanization of the casings of pneumatic tires. The mold includes a lower casing 10 mounted on a fixed platform 20 and an upper casing 11 fixed concentrically to an axially movable piston 12 of a press for forming side walls, and a series of radially movable one piece tread mold sectors 13 mounted on the lower casing 10. A tension spring 21 engages a pin provided at the front of the platform 20 and the bottom of a radial recess in each sector 13 to constantly attract each sector to its open radial position remote from the vertical axis of the press.

A guide 14 attached to a platform 15 has a tapered face which abuts against a tapered face of the movable sectors 13 thereby moving the sectors radially inward (see Figs. 2-4).

5. U.S. Patent No. 4,289,463 to Le Moullac

U.S. Patent No. 4,289,463 to Le Moullac (hereinafter "Moullac") relates to segmented molds used for molding and vulcanizing tire casings. These molds generally comprise a fixed lower mold part for molding the sidewall of a tire, an axially moveable upper mold part for molding the other tire sidewall, an assembly of molding segments for the tread, and means for radially bringing the segments toward each other to form an uninterrupted molding ring, or radially to separate them, toward an open, unmolding position.

The mold includes a fixed lower mold part 10, an axially movable upper mold part 11 for forming side walls, and a series of one piece segments 12 mounted on the lower mold part 10 for forming treads. The lower and upper mold parts have opposed concave surfaces 13, 14 for molding the tire sidewalls, and the segments have concave inner surfaces 15 presenting reliefs to mold the grooves of the tread. Segments 12 are mounted on an outer circular edge 19 of the fixed lower mold 10 so as to be slidable and swingable along radial planes. The segments 12 are continuously urged toward their open position, at the same time being pulled

back and swung up to the outside. The retraction movement is ensured, for example, by tension springs 26 hooked onto the back of the respective segments and onto fixed screw eyes 27. The springs 26 steadily urge the segments toward their radially retracted open position determined by the abutting of pins 23 on the floor of their respective stud holes 24. The sectors 12 are moved radially toward each other to form an uninterrupted molding ring for the tire tread by cooperating conical surfaces, some of which (35) are on the back of the segments 12, and others (36) are on the skirt or hoop 37 which is fixed to the upper plate 17 of the press. The plate and hoop assembly is brought into contact causing the segments 12 to radially approach one another against the urging of their recall springs 26 until the segments are tightly applied onto the mold parts and join each other circumferentially.

6. U.S. Patent No. 3,553,789 to Allitt

U.S. Patent No. 3,553,789 to Allitt (hereinafter "Allitt") relates to a tire molding apparatus and more especially to pneumatic tire molds. The mold 1 for a pneumatic tire as shown in Fig. 1, comprises a steel upper mold half 2 and a steel lower mold half 3 each having a bead and side wall molding face 2a and 3a, respectively, and eight one-piece tread molding segments 4, the segments being slidably movable radially on the lower mold half on surfaces 20 formed thereon.

Substantially frusto-conical surfaces 18 and 19 are provided both on the segments 4 and on the upper mold half 2 respectively, which surfaces cooperate as the upper mold half 2 is lowered onto the segments 4 so as to force the segments radially inward against the compression spring 6 and the annuli assembly 7. When a pneumatic tire has been molded within the mold 1 the mold closing force is removed and the upper mold half 2 moved apart from the lower mold half 3 so as to cause relative sliding movement between the substantially frusto-conical surfaces 18 and 19 and to allow each of the eight segments 4 to be moved

radially outwardly with respect to the mold axis, each segment separately under the action of the compressed spring member acting through its associated segment moving lever 5.

7. **U.S. Patent No. 6,066,283 to Nara et al.**

U.S. Patent No. 6,066,283 to Nara et al. (hereinafter "Nara") relates to a curing apparatus for curing an uncured tire by using upper and lower sector molds, as well as a method for the manufacturer of tires using the same.

The curing apparatus 11 comprises a lower mold 12 fixed to a lower base (not shown), an upper face of which mold 12 mainly forms a side wall portion (lower side wall portion) S of an uncured tire T. An upper mold 15 is fixed to an upper base (not shown) is disposed above the lower mold 12 and lifted upward and downward by lifting means (not shown) together with the upper base so as to approach to or separate from the lower mold 12. A sector mold 20 showing a ring form as a whole is disposed between the lower mold 12 and the upper mold 15, in which a one-piece forming face 21, mainly forming a tread portion D of the uncured tire T is provided on an inner periphery of the sector mold 20. The sector mold 20 is comprised of plural arc-shaped segments 22 (nine segments in the illustrated embodiment) arranged in a peripheral direction thereof. A taper ring 25 disposed at the outside of the sector mold 20 in the radial direction is fixed to the upper mold 15. The taper ring 25 approaches to or separates from the sector mold 20 with the movement of the upper mold 15. On an inner periphery of the taper ring 25 is formed a taper face 25a having the same gradient as in the taper face 22a of the arc-shaped segment 22.

When the taper ring 35 descends together with the upper mold 15 so as to contact the sector mold 20, each of the arc-shaped segments 22 is moved inward in the radial direction by a wedge action of the taper faces 22a, 25a. A compression coil spring 47 is interposed between the arc-shaped segments 22 and the lower mold 12. The spring 47 gives a rocking force directing outward to a single link 35 through the arc-shaped segments 22. When springs

43, 47 are used as the rising means and the rocking means, the arc-shaped segments 22 can be moved in a desired direction with a simple structure.

III. The Issues on Appeal

Are claims 1, 2 and 4-6 are properly rejected under 35 U.S.C. §103(a) as unpatentable over GB 1,248,891, in view of U.S. Patent No. 5,208,044, and further in view of any one of U.S. Patent No. 3,806,288, U.S. Patent No. 3,990,823, U.S. Patent No. 4,289,463, U.S. Patent No. 6,066,283, and U.S. Patent No. 3,553,789?

IV. Grouping the Claims on Appeal

Each claim of this patent application on appeal is separately patentable, and upon issuance of a patent will be entitled to a separate presumption of validity under 35 U.S.C. §282. For convenience in the handling of this appeal, the claims are grouped as follows:

Group 1, claims 1, 2, 4, 5

Group 2, claim 6

Each of Groups 1 and 2 will be argued separately. The groups do not stand or fall together.

V. Law

A. 35 U.S.C. §103(a) (Obviousness)

In rejecting claims under 35 USC 103, it is incumbent on the examiner to establish a factual basis to support the legal conclusion of obviousness. See, In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one of ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the

art. Uniroyal Inc. v. F-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note, In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). To establish prima facie obviousness of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1970). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). It is well settled that a rejection based on 35 USC 103 must rest on a factual basis, which the Patent and Trademark Office has the initial duty of supplying. In re GPAC, Inc., 57 F.3d 1573, 1582, 35 USPQ2d 1116, 1123 (Fed. Cir. 1995). A showing of a suggestion, teaching, or motivation to combine the prior art references is an "essential evidentiary component of an obviousness holding." C.R. Bard, Inc. v. M3 Sys. Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232(Fed. Cir. 1998). This evidence may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved. See Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996). However, the suggestion more often comes from the teachings of the pertinent references. See In re Rouffet, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459(Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory

statements about the teaching of multiple references, standing alone, are not "evidence." See Dembiczak, 175 F.3d at 1000, 50 USPQ2d at 1617. However, the suggestion to combine need not be express and "may come from the prior art, as filtered through the knowledge of one skilled in the art." Motorola, Inc. v. Interdigital Tech. Corp., 121 F.3d 1461, 1472, 43 USPQ2d 1481, 1489(Fed. Cir. 1997).

A prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness. It is improper to combine references where the references teach away from their combination. In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). The prior art must be looked at in its entirety, giving consideration to both technical data that teaches toward and teaches away from the present invention. Prior art "must be read as a whole and consideration must be given where the references diverge and teach away from the claimed invention." Akzo N.V. v. International Trade Comm'n, 808 F.2d 1471, 1481, 1 USPQ2d 1241, 1246 (Fed. Cir. 1986). It is error to find an invention obvious where the prior art references diverge from and teach away from the invention at hand. W.L. Gore and Assocs. v. Garlock, Inc., 721 F.2d 1540, 1550, 220 USPQ 303, 311 (Fed. Cir. 1983).

It is impermissible for an examiner to engage in hindsight reconstruction of the claimed invention using appellant's structure as a template and selecting elements from references to fill the page. The references themselves must provide some teaching whereby the appellant's combination would have been obvious. In re Gorman, 911 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir, 1991). That is, something in the prior art as a whole must suggest the desirability, and thus obviousness, of making the combination. See, In re Beattie, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992); Lindemann Machinenfabrik GMBH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984).

VI. Argument

A. Claims 1, 2, 4 and 5 are not rendered obvious by GB Patent No. 1,248,891 in view of U.S. Patent No. 5,208,044, and further in view of any one of U.S. Patent No. 3,806,288, U.S. Patent No. 3,990,823, U.S. Patent No. 4,289,463, U.S. Patent No. 6,066,283 and U.S. Patent No. 3,553,789.

Rejected claim 1 recites, among other things, "a single cam ring in direct engagement with the upper and lower tread mold members, the single cam ring being displaceable independently of approaching displacements of said sidewall mold members toward each other, to thereby simultaneously displace all of said upper and lower segments radially inwards while the single cam ring remains in direct engagement with the upper and lower tread mold members and while said upper and lower segments are in abutment with each other."

In finally rejecting claims 1, 2, 4 and 5, the Office Action correctly admitted that GB Patent No. 1,248,891 (hereinafter "British '891) "does not disclose that the cam ring simultaneously displaces all of the segments radially inwardly while the cam ring remains in direct engagement with both the upper and lower tread mold members."

To overcome the admitted deficiency, the Office Action combines U.S. Patent No. 5,208,044 (hereinafter the '044 Patent) and alleges that "it would have been obvious to one of ordinary skill in the art at the time of the invention to modify British '891 by providing the cam ring in direct engagement with both of the upper and lower tread mold members to simultaneously displace the segments radially inwardly".

However, Miyata fails to disclose the features as alleged and relied upon in the Office Action. For example, Miyata discloses a two-piece actuator 4 having separate upper and lower portions 4a and 4b. The separate upper and lower portions 4a and 4b of the actuator individually come into contact with separate upper and lower sector portions 3a and 3b.

Accordingly, the '044 Patent does not disclose a single cam ring in direct engagement with upper and lower tread mold members . . . to thereby simultaneously displace all of the upper and lower segments radially inward while the single cam ring remains in direct engagement with the upper and lower tread mold members, as recited in rejected claims 1, 2, 4 and 5. Accordingly, the combination of British '891 and the '044 Patent do not render claims 1, 2, 4 and 5 obvious.

Additionally, there is no suggestion, teaching, or motivation to combine the '044 Patent with British '891 as the '044 Patent "teaches away" from the claimed invention. For example, the '044 Patent teaches directly away from the use of a single cam ring as shown in British '891 and recited in the rejected claims. The '044 Patent discloses an actuator 4 which is divided into an upper actuator portion (or tapered ring half 4a), and a lower actuator portion (or tapered ring half 4b). The two-piece actuator is provided to overcome a problem identified in the '044 Patent caused by a single cam ring. Specifically, the '044 Patent addresses a problem caused by the use of a single cam ring as known in the prior art (D as shown in Figs. 24 and 25 of the '044 Patent representing prior art). When the actuator D is raised upon completion of vulcanization, the moveable sector C moves upward therewith. In such a case, a stepped portion is likely to occur at the tread surface, or if the separating position coincides with a pattern groove, a crack will develop. The '044 Patent also identifies an additional problem using a single cam ring D, wherein when the molds are to be closed, the respective divided pieces will not always move from the regular position to upwardly or downwardly shift the parting line of the upper and lower sector pieces, or the sector pieces are likely to move radially (for closing) as displaced from each other, failing to move in synchronism. As a result, the center (equator) of the tire is positioned off-center of the mold assembly to impair the uniformity of the tire. Therefore, the '044 Patent provides a two-piece actuator to address the problem due to equatorial shift of the tire center line, as well as the

problem of cracks developing upon separation of the mold. Accordingly, the '044 Patent teaches directly away from the use of a single cam ring, and one of ordinary skill in the art would not be motivated to make the combination as proposed in the Office Action.

Furthermore, the mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. Because the '044 Patent teaches away from the use of a single cam ring, the applied references do not suggest the desirability of such a modification.

There is also no motivation to modify the disclosure of British '891 with the disclosure in the '044 Patent because such a combination would change the principle of operation of the primary reference (British '891) and/or render the reference inoperable for its intended purpose.

For example, in British '891, the body 66 (and the upper segment 42) and the body 11 (and the lower segment 10) are moved inwardly while the ring 43 is initially engaged only with the body 66. The body 66 and the body 11 are abutted prior to the movement of the ring 43, whereby the upper mould part 2 containing the body 66 is first lowered, allowing the projections 81 of the body 66 to engage with the aligned recesses 34 of the lower segment parts containing the body 11. This initial lowering of the upper mould part 2, and the engagement of the projections 81 with the recesses 34 presses the release pin 28 downward to cause the arresting pin 22 to be forced out of the arresting bore 29.

In fact, the initial lowering of the upper mould part 2 containing the body 66 must occur prior to the downward movement of the ring 43 to allow projections 81 to displace the arresting pin 22. To allow such, British '891 discloses the support 41 to which the upper segment 42 is attached, is able to move relatively and independently with respect to the plate 45 to which the ring 43 is attached. As a result, in British '891, the cam ring simultaneously displaces all of the upper and lower segments radially inwards due to the engagement of

projections 81 and recesses 34, while the single cam ring does not remain in direct engagement with the upper and lower tread mold members.

To allow the ring 43 to move downward prior to the engagement of the projections 81 with the recesses 34 so that the upper body 66 abut body 11 will cause the projections 81 of British '891 to miss its alignment with recesses 34, and fail to cause displacement of the arresting pin 22.

Therefore, any suggested modification to the teachings in British '891 must take into account of the specific functions of the structural features such as the independently movable upper segment/ring, the projections 81, the recesses 34, and the arresting pin 22 disclosed in British '891.

However, the asserted modification of British '891 by the teachings of the '044 Patent does not take account of the above, and would require elimination of important structures of British '891. This is so because the '044 Patent assures reliable radial movement of the separate upper and lower sectors 3a, 3b by having the two distinct actuators 4a, 4b for causing relative movement of the separate upper and lower sectors 3a, 3b, respectively. Therefore in the '044 Patent, the movement of the lower actuator 4b and the lower sector 3b is assured only when the upper actuator 4a contacts the lower actuator 4b.

In the '044 Patent, the abutment of the upper and lower actuators 4a, 4b occurs simultaneously with the abutment of the upper and lower sectors 3a and 3b, respectively. This is possible in the '044 Patent because the upper sector 3a is attached to the upper actuator 4a through the upper platten 6a, which does not allow for a completely independent downward movement of the upper actuator 4a from the upper tread mold sector portion 3a, unlike the upper portion 42 and the ring 43 disclosed in British '891.

Therefore, assuring reliable inward movement of the lower tread mold member using the teaching in the '044 Patent would require use of a divided cam ring structure with an

integrated upper actuator/upper sector. However, such is incompatible with British '891's teaching of an independently movable ring/upper segment, because, for example, without the independent lowering of the ring 43 with respect to the upper segment, the displacement of the arresting pin 22 would not be assured.

Rejected claim 1 also recites, among other things, "a spring that urges the lower segments radially outwards...".

In finally rejecting claims 1, 2, 4 and 5, the Office Action also correctly admitted that "British '891 does not disclose a spring that urges the lower tread mold segments radially outwards." To overcome the admitted deficiency the Office Action combines any of U.S. Patent No. 3,806,288, U.S. Patent No. 3,990,823, U.S. Patent No. 4,289,463, U.S. Patent No. 6,066,283, and U.S. Patent No. 3,553,789 and alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify British '891 by providing a spring that urges the lower tread mold segments radially outwards.

Applicant submits that even if any of such additional references are combined with British '891 and the '044 Patent that such a combination does not render the subject matter of the rejected claims obvious, as such a combination would not overcome the admitted deficiency of British '891 and the '044 Patent discussed above.

Accordingly, the combination of British '891 and the '044 Patent with any of U.S. Patent No. 3,806,288, U.S. Patent No. 3,990,823, U.S. Patent No. 4,289,463, U.S. Patent No. 6,066,283, and U.S. Patent No. 3,553,789 does not teach, disclose or suggest the features of claim 1, 2, 4 and 5.

B. Claim 6 is not rendered obvious by GB Patent No. 1,248,891 in view of U.S. Patent No. 5,208,044, and further in view of any one of U.S. Patent No. 3,806,288, U.S. Patent No. 3,990,823, U.S. Patent No. 4,289,463, U.S. Patent No. 6,066,283 and U.S. Patent No. 3,553,789.

Rejected claim 6 recites, among other things, "a vulcanizing method for vulcanizing pneumatic tires with a vulcanizing mold...said method comprising *inter alia*...the steps of:... operating the cam ring while the cam ring remains in direct engagement with the upper and lower tread mold members to simultaneously displace all of said segments radially inwards independently of approaching displacements of said sidewall mold members toward each other and relative to said upper and lower sidewall mold members, with said upper segments in abutment with said lower segments."

Neither British '891 nor the '044 Patent, whether considered alone or in combination, disclose or suggest each and every feature recited in rejected claim 6. For example, the combination of references does not disclose the method for vulcanizing pneumatic tires with a vulcanizing mold as recited in the rejected claim.

In finally rejecting claim 6 it is correctly admitted in the Office Action that "British '891 does not disclose a cam ring that simultaneously displaces all of the segments radially inwardly while the cam ring remains in direct engagement with both upper and lower tread mold members." As such, British '891 cannot disclose a method for vulcanizing pneumatic tires with a vulcanizing mold including operating the cam ring while the cam ring remains in direct engagement with the upper and lower tread mold members, as recited in claim 6.

The '044 Patent also fails to show a cam ring which directly engages the upper and lower tread mold members, while the cam ring remains in direct engagement with the upper and lower tread mold members. Thus, the '044 Patent also does not disclose a step of operating the cam ring as described in claim 6. Rather, the '044 Patent discloses separate actuator portions 4a, 4b individually contacting corresponding individual upper and lower sector portions 3a and 3b causing the sector portions to be displaced.

Accordingly, the combination of British '891 and the '044 Patent do not teach, disclose or suggest the features of claim 6.

VII. Conclusion

Claims 1, 2 and 4-6 are not rendered obvious under 35 U.S.C. §103(a) by the combination of GB Patent No. 1,248,891 in view of U.S. Patent No. 5,208,044, and further in view of any one of U.S. Patent No. 3,806,288, U.S. Patent No. 3,990,823, U.S. Patent No. 4,289,463, U.S. Patent No. 6,066,283 and U.S. Patent No. 3,553,789.

The Honorable Board is requested to reverse the rejections set forth in the final rejection and return the application to the Examiner to pass this case to issue.

Respectfully submitted,

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JAO:JWF/ldg

Date: June 14, 2004

Enclosure:
Appendix

OLIFF & BERRIDGE, PLC
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DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

APPENDIX A

CLAIMS:

1. A vulcanizing mold for pneumatic tires, comprising:

upper and lower base plates;

upper and lower sidewall mold members for forming tire sidewall portions, said upper and lower sidewall mold members being attached to said upper and lower base plates, respectively;

upper and lower tread mold members for forming a tire tread portion, said upper and lower tread mold members being attached to said upper and lower base plates, respectively;

said upper and lower tread mold members being constituted of upper segments and lower segments, respectively, said upper and lower segments being displaceable only radially relative to said upper and lower sidewall mold members, respectively;

a spring that urges the lower segments radially outwards; and

a single cam ring in direct engagement with the upper and lower tread mold members, the single cam ring being displaceable independently of approaching displacements of said sidewall mold members toward each other, to thereby simultaneously displace all of said upper and lower segments radially inwards while the single cam ring remains in direct engagement with the upper and lower tread mold members and while said upper and lower segments are in abutment with each other.

2. The vulcanizing mold according to claim 1, wherein said upper and lower segments are indirectly engaged with said upper and lower base plates, respectively, such that they are radially displaceable relative to respective one of said sidewall mold members.

4. The vulcanizing mold according to claim 1, wherein said upper segments are always in engagement with said cam ring on radially inner side thereof.

5. The vulcanizing mold according to claim 1, further comprising abutment means for defining the upper limit position of the cam ring relative to the upper base plate.

6. A vulcanizing method for vulcanizing pneumatic tires with a vulcanizing mold which comprises: (i) upper and lower base plates; (ii) upper and lower sidewall mold members attached to said upper and lower base plates, respectively; and (iii) upper and lower tread mold members attached to said upper and lower base plates, respectively, the upper and lower tread mold members being in direct engagement with a cam ring; (iv) said upper and lower treat mold members being constituted of upper segments and lower segments, respectively, which are radially expanded and contracted relative to the upper and lower sidewall mold members, respectively, the lower segments being urged radially outwards by a spring; said method comprising the steps of:

displacing said upper and lower sidewall mold members toward each other so that said upper and lower segments are brought into abutment with each other; and

operating the cam ring while the cam ring remains in direct engagement with the upper and lower tread mold members to simultaneously displace all of said segments radially inwards independently of approaching displacements of said sidewall mold members toward each other and relative to said upper and lower sidewall mold members, with said upper segments in abutment with said lower segments.